

REMARKS

Claims 18-33 and 58-66 remain pending in the present application. Applicant has amended 18, 23-24, 26-29, 58, 60, and 63. Applicant respectfully requests reconsideration and allowance of pending claims 18-33 and 58-66 in view of the following remarks.

A. Rejection of Claims 18-20, 22-33, and 58-66 Under 35 USC §102(b)

The Examiner has rejected claims 18-20, 22-33, and 58-66 under 35 USC §102(b) as being anticipated by U.S. patent number 5,640,048 to Selna. (“Selna”). For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by amended independent claims 18 and 58, is patentably distinguishable over Selna.

Selna does not teach, disclose, or suggest a structure comprising bond pads abutting a set of conductive vias. In fact, unlike the present invention, Selna discloses a ball grid array with traces (e.g. 8A) on top of the substrate wherein the traces are coupled to conductive vias (e.g. 6A) located in the substrate. Selna does not disclose a bond pad abutting each of the conductive vias for electrically connecting each device electrode of a semiconductor chip to the PCB. Instead, Selna connects (e.g. through 22) the device electrode to the traces (e.g. 8A), thus directly coupling the electrode to the traces. See Selna Figures 2 and 3.

In contrast, the present invention, as defined by amended independent claims 18 and 58, teaches, among other things, a structure comprising a substrate having a plurality

of separate thermally conductive vias that are connected to a heat spreader attached to the bottom of the substrate and a second set of conductive vias abutting separate bond pads. Even without traces, the bond pads, through the second set of conductive vias, provide for electrical connection between device electrodes on a semiconductor chip and a printed circuit board. Traces are not needed between the bond pads and the second set of conductive vias in order to reduce parasitic inductance.

In addition, the plurality of separate thermally conductive vias of the present invention provide an effective thermal conduit to transfer heat from a semiconductor chip situated on the top surface of the substrate to the heat spreader attached to the bottom of the substrate. The plurality of separate thermally conductive vias also provide an effective low resistance electrical conduit from the top surface of the substrate to the heat spreader.

Thus, applicant submits that the present invention is patentably distinguishable over Selna.

B. Rejection of Dependent Claims 19-33, and 59-66

The Examiner has rejected claims 19-20, 22-33, and 59-66 under 35 USC §102(b) as being anticipated by U.S. patent number 5,640,048 to Selna ("Selna"), and rejects claim 21 under 35 USC §103(a) as being unpatentable over Selna in view of "Admitted prior art."


Applicant submits that dependent claims 19-33 and 59-66, being dependent upon allowable base claims, are allowable for at least the foregoing reasons.

C. **Conclusion**

For all the foregoing reasons, Applicant submits that claims 18-33 and 58-66 pending in the present application are patentably distinguishable over the cited art and, as such, an early Notice of Allowance is respectfully requested.

Respectfully Submitted,
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